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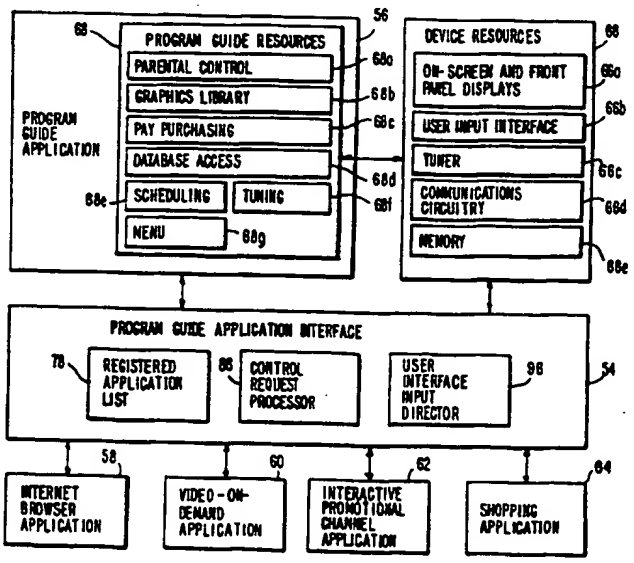
(54) Title: PROGRAM GUIDE APPLICATION INTERFACE SYSTEM



(57) Abstract

A program guide system is provided that supports a program guide application and multiple non-guide applications. The program guide system has a program guide application interface that allows the non-guide applications to use both device resources and program guide resources. The application interface maintains a list of registered applications and directs control requests from various applications to the current primary application. The application interface also has a user interface input director that directs keystrokes and other user input commands to the appropriate application. If a keystroke for the program guide application is detected while a non-guide application is running, the program guide application is invoked.

PROGRAM GUIDE APPLICATION INTERFACE SYSTEM

Background of the Invention

This invention relates to systems that support an interactive television program guide application and non-guide applications. More particularly, the invention relates to systems in which non-guide applications can use both device resources and program guide resources.

Cable, satellite, and broadcast television systems provide viewers with a large number of television channels. Viewers have traditionally consulted printed television program schedules to determine the programs being broadcast at a particular time. More recently, interactive electronic television program guides have been developed that allow television program information to be displayed on a viewer's television.

Interactive program guides are typically implemented on set-top boxes. Such program guides

running when the program guide application would normally have issued a reminder (e.g., for an upcoming television event), the user may not be able to receive the reminder. Moreover, the relatively high-level resources of the program guide application (such as parental control, program guide database access functions, etc.) have been unavailable to non-guide applications.

It is therefore an object of the present invention to provide an interactive television program guide system in which a program guide application and other applications may be implemented on the same set-top box and in which non-guide applications may use program guide resources.

Summary of the Invention

This and other objects of the invention are accomplished in accordance with the principles of the present invention by providing an interactive program guide system which supports a program guide application and multiple non-guide applications. The system may be implemented on a set-top box or a comparable hardware platform. The program guide application runs on the set-top box to provide an interactive display of television program listings. A user may use the program guide to search for listings based on keywords, to order pay programs, to select a television program for recording, etc. The non-guide applications that run on the set-top box may include applications such as an Internet browser application, a video-on-demand application, an interactive promotional channel application, a shopping application, an electronic mail

the program guide application interface with key lists that identify the keys that application desires to use when it is the active application and when it is a background application.

The program guide application interface resolves conflicts between various applications as the applications contend for shared resources. For example, the application interface may coordinate requests from different applications to use the same key or to simultaneously use the display. In resolving such conflicts, the application interface may take account of which resources may not be shared, which resources may be shared without restriction, and which resources may be shared only with the guidance of the application interface.

Further features of the invention, its nature and various advantages will be more apparent from the accompanying drawings and the following detailed description of the preferred embodiments.

Brief Description of the Drawings

FIG. 1 is a schematic diagram of a system in accordance with the present invention.

FIG. 2 is a schematic diagram of illustrative user television equipment in accordance with the present invention.

FIG. 3 is a schematic diagram showing the relationship between a program guide application interface, program guide application, non-guide applications, and various device resources in accordance with the present invention.

link, a telephone network link, a cable or fiber optic link, a microwave link, a combination such links, or any other suitable communications path. Television distribution facility 16 may be a cable system headend, a broadcast distribution facility, or a satellite television distribution facility. If desired, television distribution facility 16 may have the capability to support (either alone or in combination with additional facilities) services such as Internet access, home shopping, video-on-demand services, electronic mail applications, audio-on-demand applications, banking applications, data services applications, wagering applications, etc. For example, if video-on-demand services are desired, television distribution facility 16 may contain a video or audio server. If home shopping services are to be provided, television distribution facility 16 may contain a home shopping database or may support communications to a home shopping service provider. Internet access may be provided by a server within television distribution facility 16 or may be provided by facilitating communications with a separate Internet service provider. Banking, wagering, and data services may be provided using facilities separate from television distribution facility 16. If desired, such separate facilities may be accessed through television distribution facility 16.

The data transmitted by main facility 12 to television distribution facility 16 includes television program guide data such as program times, channels, titles, descriptions and other program listings information, and pay program pricing information, copy

programming, video-on-demand services, and other video information to user equipment 22 in addition to program guide data and data for other services. If desired, program guide data and data for other services may be distributed by one or more distribution facilities that are similar to but separate from television distribution facility 16 using communications paths that are separate from communications paths 20.

Certain functions such as pay program purchasing may require user equipment 22 to transmit data to distribution facility 16 over communications paths 20. If desired, such data may be transmitted over telephone lines or other separate communications paths (not shown). Functions such as Internet services, home shopping services, etc. may also be provided using separate communications paths.

Multiple television channels (analog, digital, or both analog and digital) may be provided to set-top box 24 via communications path 20. During normal television viewing, the user tunes set-top box 24 to a desired one of these channels. The signal for that television channel may then be provided at video output 32 as a radio-frequency (RF) signal on a predefined channel (e.g., channel 3 or 4) or as a demodulated video signal. The video signal at output 32 is received by videocassette recorder 26, so that the user may record programs. Program recording and other features may be controlled by set-top box 24 using control path 34. A typical control path 34 involves the use of an infrared transmitter coupled to the infrared receiver in videocassette recorder 26 that normally accepts commands from a remote control. Such

of wireless devices, hardwired remotes or keyboards, voice-recognition devices, etc.

Set-top box 24 may contain one or more data ports such as data port 42 for interfacing with local equipment such as a personal computer, printer or the like. Data port 42 may be compatible with any suitable communications protocol, such the IEEE 1394 bus standard, the RS-232 bus standard, or the USB (Universal Serial Bus) standard.

Indicators 44 may be used to display certain information directly on set-top box 24. For example, numeric indicators may be used to display the current channel to which set-top box 24 is tuned. Dedicated single-element indicators may be used to indicate that the power in the system is on or that a message has been received, etc.

Infrared transmitter 46 may be used to transmit control commands to the infrared receiver in videocassette recorder 26 (e.g., to direct videocassette recorder 26 to turn on and to record a television program that the user has selected from the program guide).

Memory 48 may be used to store data and instructions for execution by a microprocessor contained in control circuitry 40.

Set-top box 24 also contains tuning, communications, and display circuitry 50. Circuitry 50 handles tuning functions such as receiving and demodulating analog and digital video and audio streams. Circuitry 50 may also descramble pay channels and video-on-demand channels. If a program is copy protected and set-top box 24 receives proper

displayed include program listings grids, web pages, product lists, promotional information, etc.

FIG. 3 shows how the system of the present invention has a program guide application interface 54 that supports a program guide application 56 and one or more non-guide applications such as Internet browser application 58, video-on-demand application 60, interactive promotional channel application 62, and shopping application 64. Other non-guide applications that may be supported include electronic mail applications, audio-on-demand applications, banking applications, data services applications, wagering applications, etc. Program guide application interface 54 may be part of program guide application 56 or may be separate, as shown in FIG. 3. Program guide application 56 provides the features of an interactive program guide using program guide resources 68. For example, program guide application 68 may obtain program listings data previously stored in memory using database access resource 68d. Program listings data may be displayed using various templates and display functions of graphics library resource 68b. Pay programs may be purchased using pay purchasing resource 68c. Program guide application 56 allows parents to lock programs using parental control resource 68a. Programs may be scheduled for recording and reminders for certain programs may be set using scheduling resource 68e. Tuning resource 68f may be used to ensure that the channels to which the program guide or other application that uses resource 68f tune satisfy predefined parental control criteria (using resource 68c) and are displayed properly on the viewer's display

Nevertheless, using the functions of graphics library resource 68b rather than using display resource 66a directly conserves resources, because the functions provided by graphics library resource 68b do not need to be duplicated by video-on-demand application 60.

Another program guide resource that video-on-demand application 60 may use is database access resource 68d. Database access resource 68d is a program guide resource that allows program guide application 56 to access program data (e.g., program titles, times, channels, ratings, summary information, etc.) that has been stored in memory. Although such data might be retrieved directly from memory using memory resource 66e, the database management functions of database access resource 68d help facilitate the orderly storage and retrieval of program data in memory. As a result, it is more efficient for video-on-demand application 60 to use database access resource 68d than to duplicate such functions within video-on-demand application 60.

Some of the functions of video-on-demand application 60 may be best provided using device resources 66. For example, when a user places an order for a video, the order may be transmitted via an upstream data path to a video server in television distribution facility 16. Such upstream transmissions can be accomplished using communications circuitry resource 66d.

Another illustrative example involves Internet browser application 58, which primarily relies on direct use of device resources 66. Display functions may be provided using display resource 66a.

to display banners and templates for program titles and program summary information.

Shopping channel application 64 may use graphics library resource 68b to display product lists. Communications circuitry resource 66d may be used to transmit product orders to an order processing facility. Various input devices may be supported using user input interface resource 66b, such as remote control 30a, keyboard 30b, and pointing device 30c.

These examples are illustrative only. Various other suitable applications may be used and such applications may use any suitable combinations of functions provided by program guide resources 68 and device resources 66.

The process by which program guide application interface 54 handles requests from the non-guide applications to use program guide resources 68 and device resources 66 is shown in FIG. 4a. At step 70, program guide application interface 54 receives and processes requests from applications to use resources (e.g., to use graphics library 68b or display 66a). If a request is made to use one of device resources 66, program guide application interface 54 directs the request to device resources 66 at step 72, so that the requesting application may use the requested device resource 66. If a request is made to use one of program guide resources 68, program guide application interface 54 directs the request to program guide resources 68 at step 74. At step 76, the requesting application uses the device resources 66 that are involved in the use of the requested program guide resources 68 (e.g., the requesting application uses

when the application is running in the background (i.e., a background key list). The application interface may take the contents of such lists into account when deciding how to resolve a conflict between two applications that are requesting use of the same remote control key or any other shared resource. In resolving conflicts, the application interface may take into account that certain resources may be shared, some resources may not be shared, and other resources may be shared, but only through the intervention of the application interface. An example of a resource that may be shared through the intervention of the application interface are the front-panel set-top box light-emitting diodes. At step 114, the program guide application interface directs resource requests to the device and program guide resources.

In order to facilitate operation of the system of the present invention with multiple applications, program guide application interface 54 maintains a registered application list 78 (FIG. 3) that allows interface 54 to keep track of which applications are loaded in set-top box 24 (FIG. 2) and how to communicate with them.

The process by which program guide application interface 54 maintains registered application list 78 is shown in FIG. 5. An application registers by supplying a communications address and an identifier to program guide application interface 54. The communications address and identifier are received by program guide application interface 54 at steps 80 and 82. At step 84, program guide application interface 54 updates registered application list 78 of

video-on-demand application 60). At step 90, control request processor 86 determines which application is the current primary application and directs the control request to that application. At step 92, the primary application (e.g., shopping application 64) determines whether to relinquish control based on preset or dynamic priorities. If the primary application does not relinquish control to the requesting application at step 92, control returns to step 88. If the primary application does relinquish control at step 92, the requesting application takes primary control of the operation of set-top box 24 (FIG. 1) at step 94.

The operation of control request processor 86 that is shown FIG. 6a is illustrative only. Other suitable arrangements for handling control requests may be used. For example, program guide application interface 54 may handle the determination of which application should maintain primary control of the system rather than the primary application.

As shown in FIG. 6b, control request processor 86 may also handle requests to suspend the operation of the primary application, rather than simply to terminate its operation. At step 116, control request processor 86 of program guide application interface 54 receives a suspend request from a requesting application (e.g., video-on-demand application 60). At step 118, control request processor 86 determines which application is the current primary application and directs the suspend request to that application. At step 120, the primary application (e.g., shopping application 64) determines whether to suspend its operation based on preset or

appropriate application while conflicts between applications are resolved. In order to resolve conflicts that may occur when multiple applications request access to the same user input device (e.g., remote control keys), each application may submit to the application interface a predefined list of which keys are desired when that application is active (an active key list) and a list of which keys are desired when the application is running in the background (a background key list). Applications may submit such key lists to the application interface at device registration (FIG. 5) or dynamically, at any suitable time during the operation of the system. Applications may assign priorities to their key requests by adding priority entries to the key lists if desired. The application interface may take the contents of such lists into account when deciding how to resolve a conflict between two applications that are requesting use of the same remote control key.

The foregoing is merely illustrative of the principles of this invention and various modifications can be made by those skilled in the art without departing from the scope and spirit of the invention.

5. The system defined in claim 1 wherein the device resources further comprise at least one device resource selected from the group consisting of: an on-screen display resource, a front-panel display resource, a user input interface resource, a tuner resource, a communications circuitry resource, and a memory resource.

6. The system defined in claim 1 wherein at least one of the program guide resources comprises a tuning resource.

7. The system defined in claim 1 wherein at least one of the program guide resources comprises a parental control resource.

8. The system defined in claim 1 wherein at least one of the program guide resources comprises a graphics library resource.

9. The system defined in claim 1 wherein at least one of the program guide resources comprises a pay program purchasing resource.

10. The system defined in claim 1 wherein at least one of the program guide resources comprises a program guide database access resource.

11. The system defined in claim 1 wherein at least one of the program guide resources comprises a scheduling resource.

20. The system defined in claim 1 further comprising:

a user input device; and

means for resolving conflicts between applications that desire access to the user input device at the same time.

21. The system defined in claim 1 further comprising:

remote control keys for controlling the user television equipment; and

means for resolving conflicts between applications that request access to the same remote control keys.

22. A method for using a system in which an interactive television program guide and non-guide applications are implemented on user television equipment, comprising:

providing a plurality of device resources within the user television equipment;

providing a plurality of program guide resources associated with the interactive television program guide; and

allowing the non-guide applications to use both the program guide resources and the device resources.

23. The method defined in claim 22 wherein the step of providing the program guide application interface further comprises the step of receiving and

further comprises the step of providing a parental control resource.

29. The method defined in claim 22 wherein the step of providing the interactive program guide further comprises the step of providing a graphics library resource.

30. The method defined in claim 22 wherein the step of providing the interactive program guide further comprises the step of providing a pay program purchasing resource.

31. The method defined in claim 22 wherein the step of providing the interactive program guide further comprises the step of providing a program guide database access resource.

32. The method defined in claim 22 wherein the step of providing the interactive program guide further comprises the step of providing a scheduling resource.

33. The method defined in claim 22 wherein the step of providing the interactive program guide further comprises the step of providing a program guide menu resource.

34. The method defined in claim 22 further comprising the step of maintaining a registered application list.

42. The method defined in claim 22 wherein the system includes remote control keys for controlling the user television equipment, the method further comprising resolving conflicts between applications that request access to the same remote control keys.

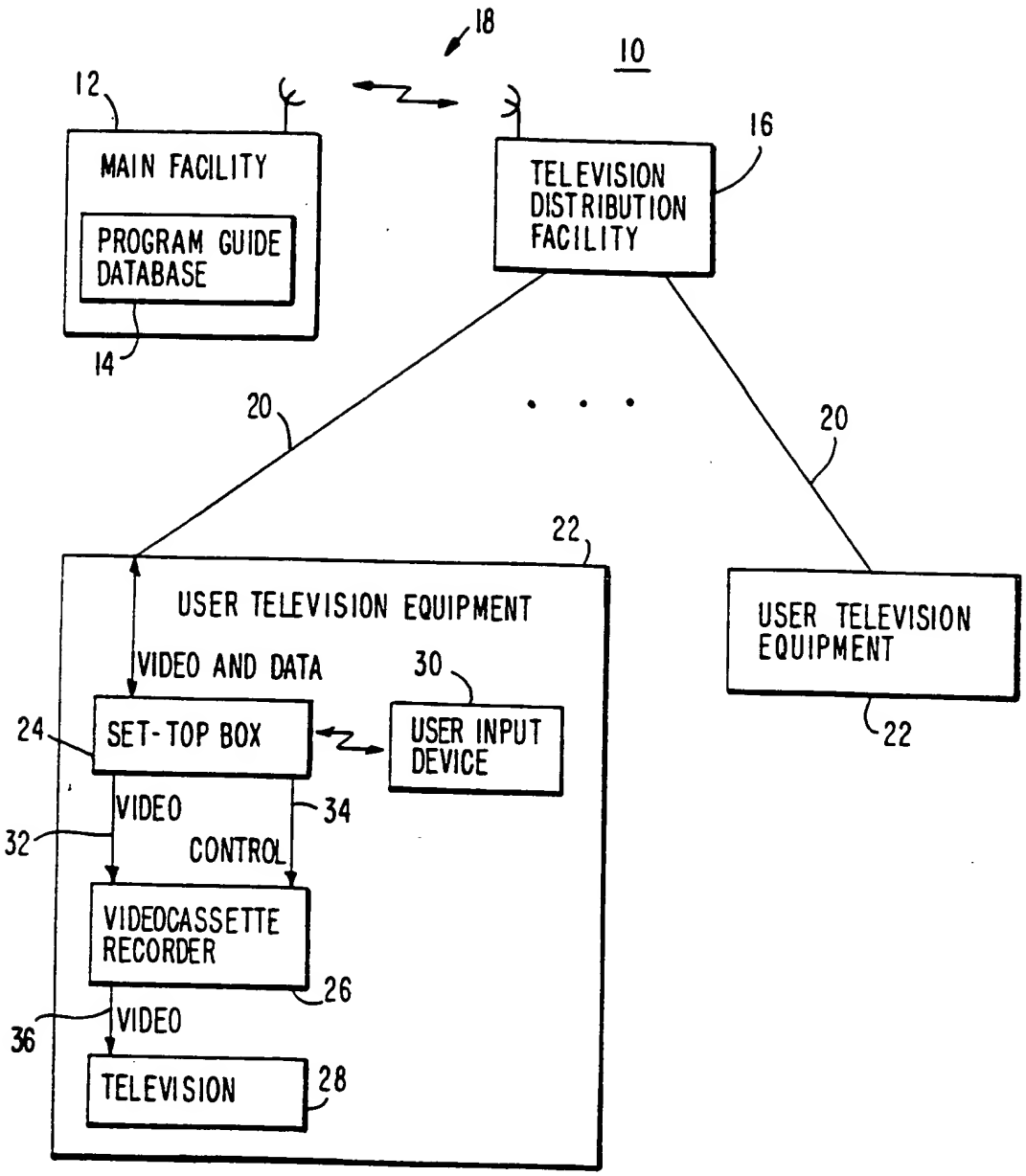

18
10
12
MAIN FACILITY
PROGRAM GUIDE DATABASE
14
16
TELEVISION DISTRIBUTION FACILITY
20
20
22
USER TELEVISION EQUIPMENT
VIDEO AND DATA
30
24
SET-TOP BOX
USER INPUT DEVICE
VIDEO
34
32
CONTROL
VIDEOCASSETTE RECORDER
26
VIDEO
36
TELEVISION
28
USER TELEVISION EQUIPMENT
22

FIG. 1

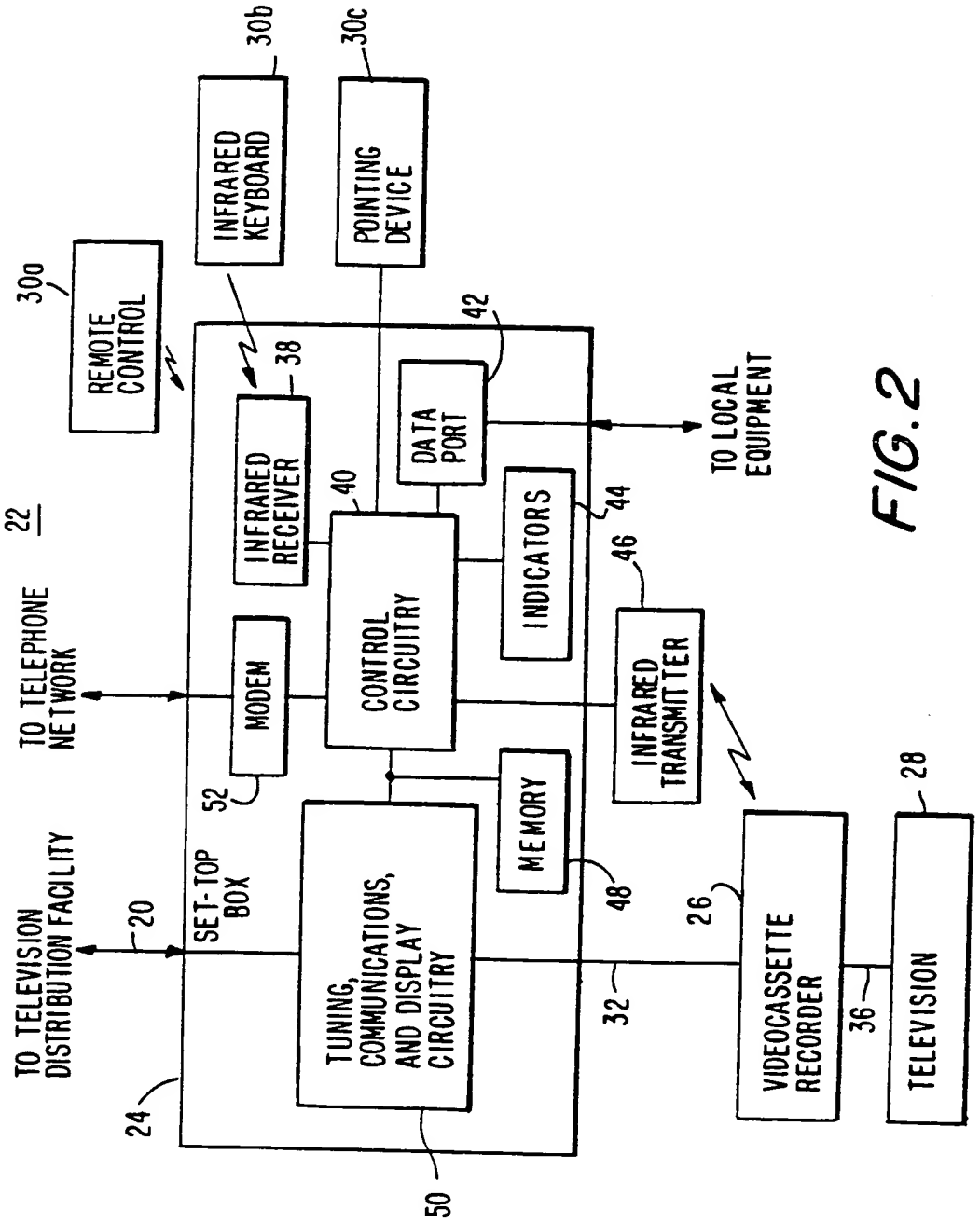

30a
REMOTE CONTROL
30b
INFRARED KEYBOARD
30c
POINTING DEVICE
22
TO TELEPHONE NETWORK
TO TELEVISION DISTRIBUTION FACILITY
20
SET-TOP BOX
24
MODEM
52
INFRARED RECEIVER
38
CONTROL CIRCUITRY
40
DATA PORT
42
INDICATORS
44
INFRARED TRANSMITTER
46
MEMORY
48
TUNING, COMMUNICATIONS, AND DISPLAY CIRCUITRY
50
TO LOCAL EQUIPMENT
VIDEOCASSETTE RECORDER
26
32
TELEVISION
28
36

FIG. 2

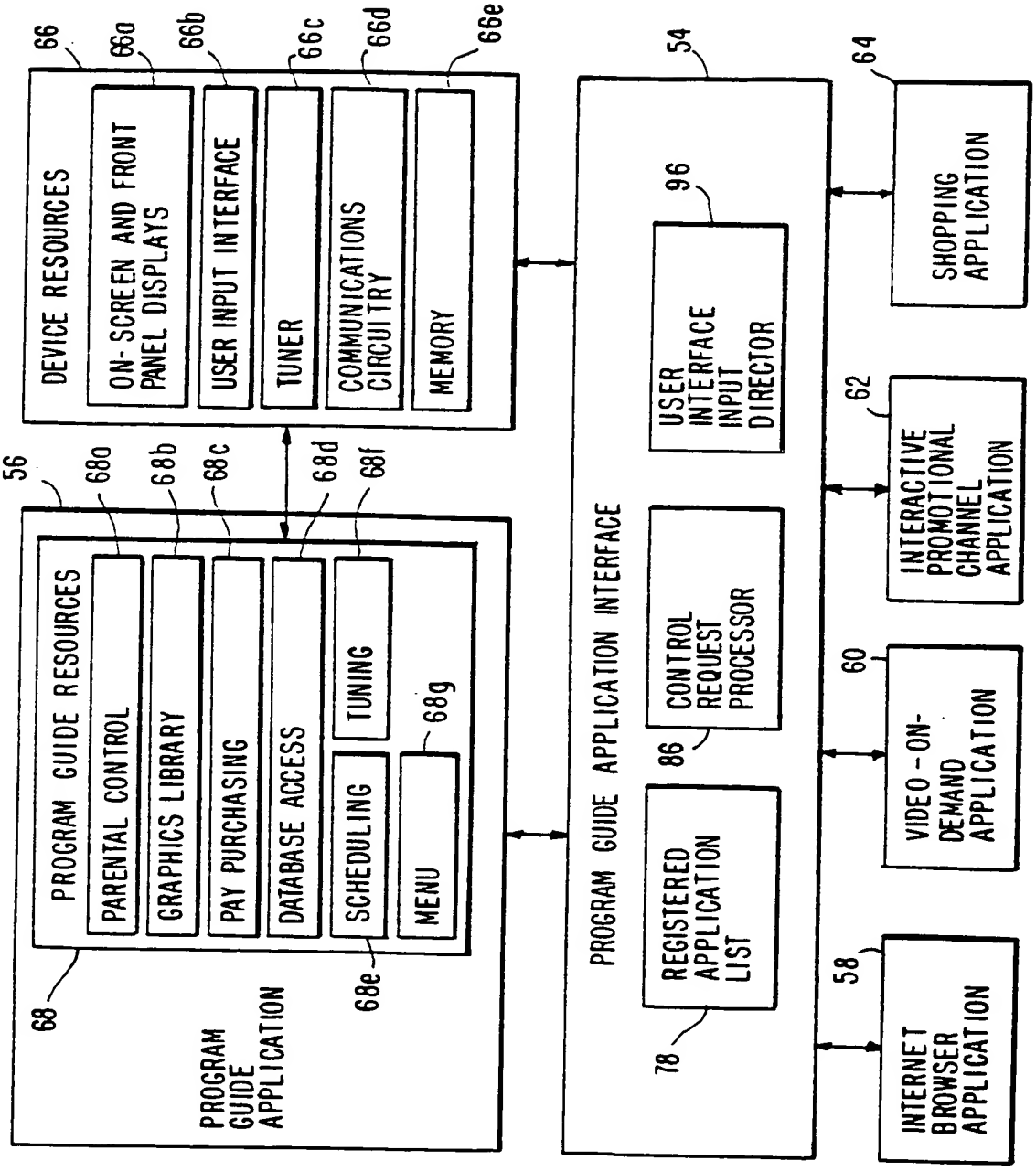

66
66a
66b
66c
66d
66e
DEVICE RESOURCES
ON-SCREEN AND FRONT PANEL DISPLAYS
USER INPUT INTERFACE
TUNER
COMMUNICATIONS CIRCUITRY
MEMORY
54
64
96
USER INTERFACE INPUT DIRECTOR
SHOPPING APPLICATION
62
INTERACTIVE PROMOTIONAL CHANNEL APPLICATION
56
68a
68b
68c
68d
68f
PROGRAM GUIDE RESOURCES
PARENTAL CONTROL
GRAPHICS LIBRARY
PAY PURCHASING
DATABASE ACCESS
TUNING
SCHEDULING
MENU
68g
68
68e
PROGRAM GUIDE APPLICATION
PROGRAM GUIDE APPLICATION INTERFACE
86
CONTROL REQUEST PROCESSOR
78
REGISTERED APPLICATION LIST
60
VIDEO-ON-DEMAND APPLICATION
58
INTERNET BROWSER APPLICATION

FIG. 3

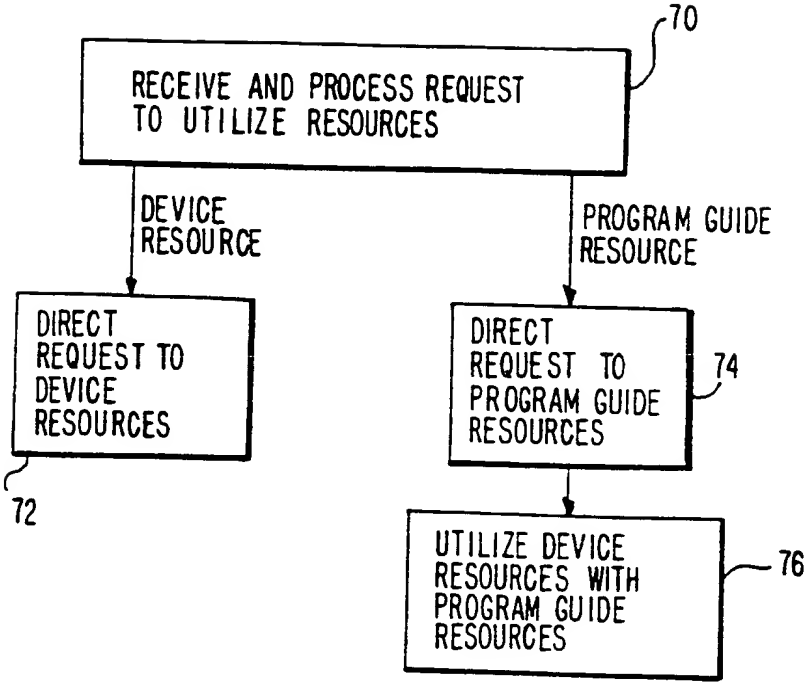

70
RECEIVE AND PROCESS REQUEST TO UTILIZE RESOURCES
DEVICE RESOURCE
PROGRAM GUIDE RESOURCE
DIRECT REQUEST TO DEVICE RESOURCES
72
DIRECT REQUEST TO PROGRAM GUIDE RESOURCES
74
UTILIZE DEVICE RESOURCES WITH PROGRAM GUIDE RESOURCES
76

FIG. 4a

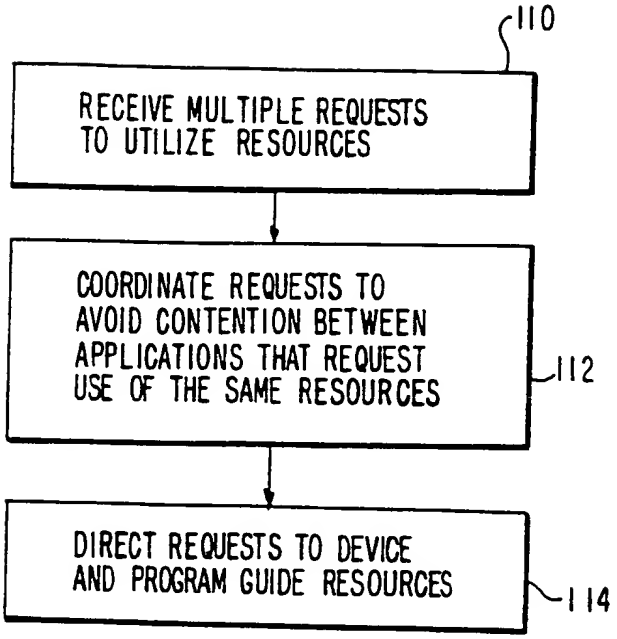

110
RECEIVE MULTIPLE REQUESTS TO UTILIZE RESOURCES
COORDINATE REQUESTS TO AVOID CONTENTION BETWEEN APPLICATIONS THAT REQUEST USE OF THE SAME RESOURCES
112
DIRECT REQUESTS TO DEVICE AND PROGRAM GUIDE RESOURCES
114

FIG. 4b

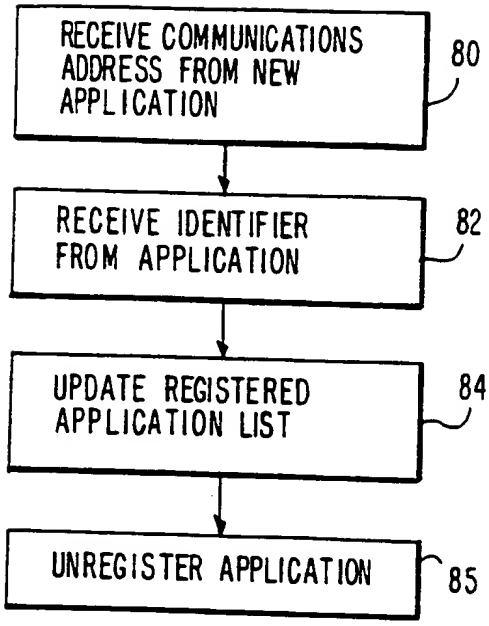

RECEIVE COMMUNICATIONS ADDRESS FROM NEW APPLICATION
80
RECEIVE IDENTIFIER FROM APPLICATION
82
UPDATE REGISTERED APPLICATION LIST
84
UNREGISTER APPLICATION
85

FIG. 5

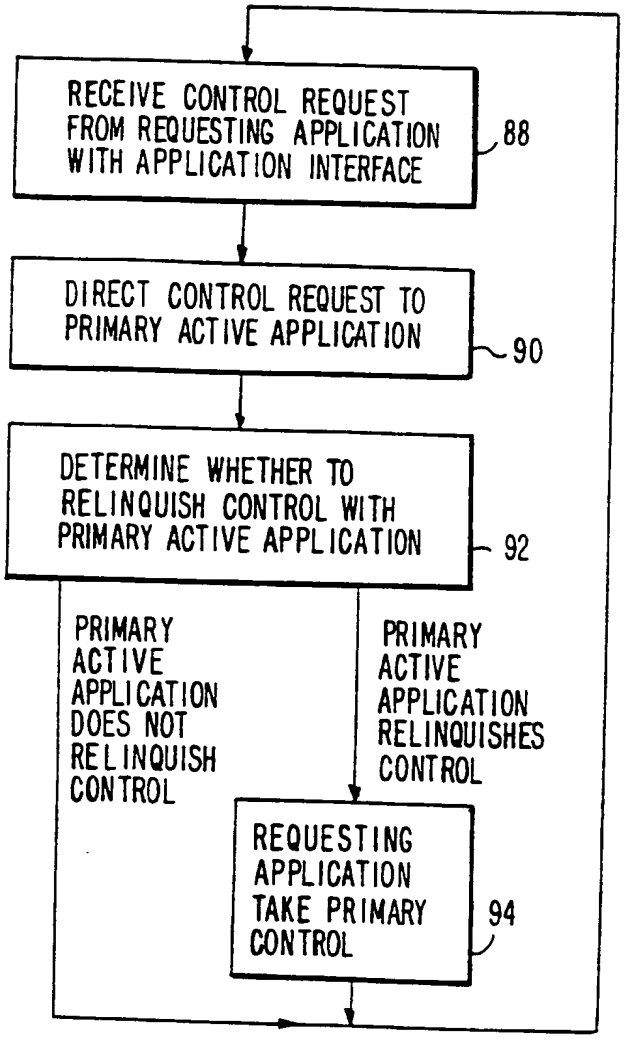

RECEIVE CONTROL REQUEST FROM REQUESTING APPLICATION WITH APPLICATION INTERFACE
88
DIRECT CONTROL REQUEST TO PRIMARY ACTIVE APPLICATION
90
DETERMINE WHETHER TO RELINQUISH CONTROL WITH PRIMARY ACTIVE APPLICATION
92
PRIMARY ACTIVE APPLICATION DOES NOT RELINQUISH CONTROL
PRIMARY ACTIVE APPLICATION RELINQUISHES CONTROL
REQUESTING APPLICATION TAKE PRIMARY CONTROL
94

FIG. 6a

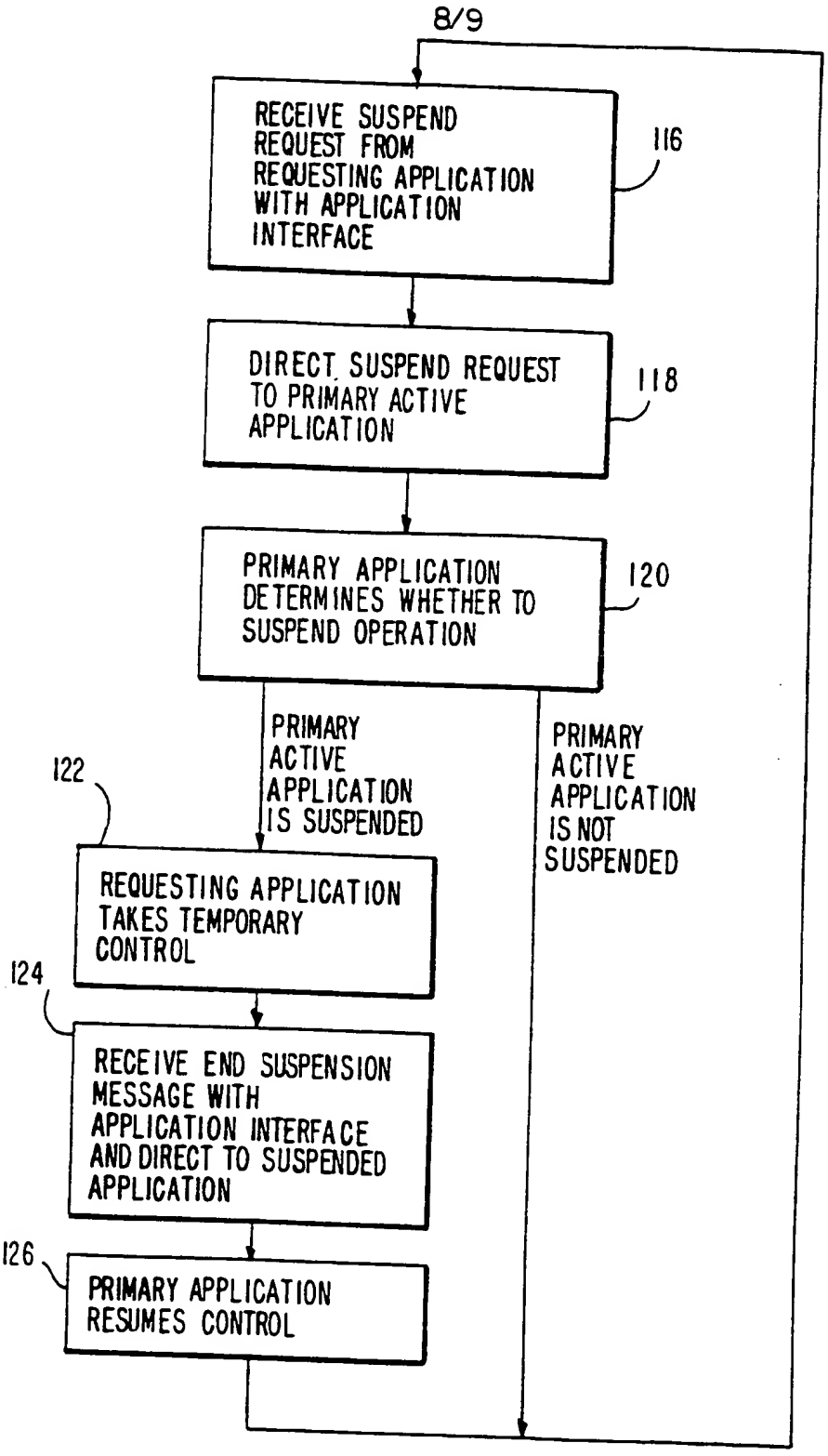

RECEIVE SUSPEND REQUEST FROM REQUESTING APPLICATION WITH APPLICATION INTERFACE
116
DIRECT SUSPEND REQUEST TO PRIMARY ACTIVE APPLICATION
118
PRIMARY APPLICATION DETERMINES WHETHER TO SUSPEND OPERATION
120
PRIMARY ACTIVE APPLICATION IS SUSPENDED
PRIMARY ACTIVE APPLICATION IS NOT SUSPENDED
122
REQUESTING APPLICATION TAKES TEMPORARY CONTROL
124
RECEIVE END SUSPENSION MESSAGE WITH APPLICATION INTERFACE AND DIRECT TO SUSPENDED APPLICATION
126
PRIMARY APPLICATION RESUMES CONTROL

FIG. 6b

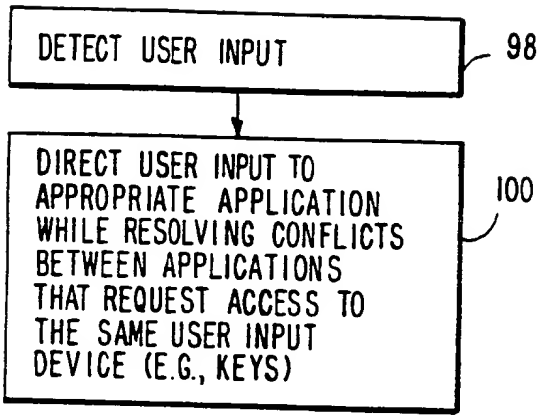

DETECT USER INPUT
98
DIRECT USER INPUT TO APPROPRIATE APPLICATION WHILE RESOLVING CONFLICTS BETWEEN APPLICATIONS THAT REQUEST ACCESS TO THE SAME USER INPUT DEVICE (E.G., KEYS)
100

FIG. 7

INTERNATIONAL SEARCH REPORT

Int tional Application No
PCT/US 98/18191

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04N5/445

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 589 892 A (KNEE R. ET AL) 31 December 1996 see the whole document ---	1-12,15, 22-33,36
A	WO 97 13368 A (STARSIGHT TELECAST INC.) 10 April 1997 see the whole document ---	1-12,15, 22-33,36
A	RATH K. ET AL: "SET-TOP BOX CONTROL SOFTWARE: A KEY COMPONENT IN DIGITAL VIDEO" PHILIPS JOURNAL OF RESEARCH., vol. 50, no. 1, 30 July 1996, pages 185-199, XP004008210 EINDHOVEN NL see the whole document --- -/--	1-12,15, 22-33,36

[X] Further documents are listed in the continuation of box C

[X] Patent family members are listed in annex.

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"E" earlier document but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search	Date of mailing of the international search report
10 December 1998	18/12/1998

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Verschelden, J

2

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int'l Application No PCT/US 98/18191

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5589892 A	31-12-1996	US 5781246 A	14-07-1998
		AU 6258596 A	30-12-1996
		CA 2223057 A	19-12-1996
		CN 1190517 A	12-08-1998
		EP 0856227 A	05-08-1998
		PL 323914 A	27-04-1998
		WO 9641478 A	19-12-1996
		AU 5572996 A	18-11-1996
		CA 2218993 A	31-10-1996
		EP 0823179 A	11-02-1998
		PL 323047 A	02-03-1998
		WO 9634491 A	31-10-1996
		US 5585866 A	17-12-1996
		US 5822123 A	13-10-1998
WO 9713368 A	10-04-1997	AU 7387196 A	28-04-1997
		CA 2232003 A	10-04-1997
		EP 0880856 A	02-12-1998
US 5635979 A	03-06-1997	AU 2657995 A	21-12-1995
		WO 9533338 A	07-12-1995
		US 5666293 A	09-09-1997
		US 5768539 A	16-06-1998
US 5481542 A	02-01-1996	AU 1087095 A	29-05-1995
		BR 9408030 A	17-12-1996
		CA 2176131 A	18-05-1995
		CN 1134771 A	30-10-1996
		EP 0728398 A	28-08-1996
		JP 9505186 T	20-05-1997
		WO 9513681 A	18-05-1995